

wherein the additional etching stop film is of a different material than the etching stop film under the first organic insulating film so as to improve efficiency of producing the semiconductor device.

11. (New) The method of claim 10, wherein the additional etching stop film comprises an oxide and the etching stop film under the first organic insulating layer comprises an oxide.

REMARKS

This is in response to the Office Action dated April 11, 2002. Claim 7 has been canceled. New claims 10-11 have been added. Thus, claims 1-6 and 8-11 are now pending. Attached hereto is a marked-up version of the changes made to the claim(s) by the current amendment. The attached page(s) is captioned "Version With Markings To Show Changes Made."

Claims 1, 2, 4-6 and 8-9 stand rejected under 35 U.S.C. Section 102(b) [presumably Section 102(e)] as being allegedly anticipated by Cronin (US 6,143,640). This Section 102 rejection is respectfully traversed for at least the following reasons.

Claim 1 requires "forming an opening by etching process using a resist pattern as a mask in a multi-layered film including a nitride etching stop film, a first organic insulating film, a first oxide etching stop film and a second organic insulating film being layered in this order such that the opening penetrates from the second organic insulating film to the first organic insulating film, wherein a second oxide etching stop film is

formed between the resist pattern and the second organic insulating film to protect the second organic insulating film from being etched during the formation of the opening."

Thus, referring to Fig. 1 of the instant application for purposes of example only, a method according to an example embodiment includes forming an opening by etching process using a resist pattern (7) as a mask in a multi-layered film including a nitride etching stop film (2), a first organic insulating film (3), a first oxide etching stop film (4) and a second organic insulating film (5) being layered in this order such that the opening penetrates from the second organic insulating film to the first organic insulating film, wherein a second oxide etching stop film (6) is formed between the resist pattern (7 and/or 9) and the second organic insulating film to protect the second organic insulating film (5) from being etched during the formation of the opening.

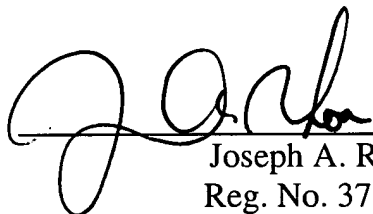
Thus, it can be seen that in claim 1 one of the etch stop films is required to be a nitride, while two other etch stop films are required to be oxide(s). Forming different etch stop films from different materials (e.g., nitride vs. oxide) may be beneficial, for example, when performing the etching of Figs. 1(f)-(g) so that the bottom etch stop film 2 is not significantly etched along with etch stop 6. Moreover, oxide etch stop films are advantageous over nitride etch stops in the context of claim 1 since the oxide etch stop(s) have a much lower dielectric constant than that of a nitride film. In view of the oxide etch stop's lower dielectric constant, interconnection capacity can be reduced more with an oxide etch stop than a nitride etch stop in many instances. The cited Cronin reference fails to disclose or suggest the claimed nitride and *oxide* etching stop films required by claim 1.

Cronin, in Figs. 13-14 for example, discloses nitride etch stop 26, nitride etch stop 42, polyimide insulator 44, nitride etch stop 46, polyimide insulator 48, nitride etch stop 50, and resist 53. Resist 53 appears to be used to form vias 57 in the multilayer film. Thus, it can be seen that *all of Cronin's etch stop films are nitrides*. Thus, Cronin fails to disclose or suggest the different etch stop films of different materials as required by claim 1. In particular, Cronin fails to disclose or suggest the two oxide etch stop films required by claim 1. Instead, Cronin teaches directly away from the invention of claim 1 by requiring that all etch stops be a nitride.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are believed to be in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please cancel claim 7.

1. (Amended) A method for producing a semiconductor device comprising[;]:

forming an opening by etching process using a resist pattern as a mask in a multi-layered film [having] including a nitride etching stop film, a first organic insulating film, a first oxide etching stop film and a second organic insulating film being layered in this order such that the opening penetrates from the second organic insulating film to the first organic insulating film,


wherein a second oxide etching stop film is formed between the resist pattern and the second organic insulating film to protect the second organic insulating film from being etched during the formation of the opening.

Please add the following new claims:

10. (New) A method for producing a semiconductor device comprising:

forming an opening by etching process using a resist pattern as a mask in a multi-layered film including an etching stop film, a first organic insulating film, another etching stop film and a second organic insulating film being layered in this order such that the opening penetrates from the second organic insulating film to the first organic insulating film,

wherein an additional etching stop film is formed between the resist pattern and the second organic insulating film to protect the second organic insulating film from being etched during the formation of the opening, and

 wherein the additional etching stop film is of a different material than the etching stop film under the first organic insulating film so as to improve efficiency of producing the semiconductor device.

11. (New) The method of claim 10, wherein the additional etching stop film comprises an oxide and the etching stop film under the first organic insulating layer comprises an oxide.